

REMARKS

This responds to the Office Action dated September 24, 2007, and the references cited therewith. No claims are amended herein. Claims 1-36 are now pending in this application and have been rejected in the Office Action under section 102 or section 103. The rejections are traversed and reconsideration is respectfully requested.

§102 Rejection of the Claims

Claims 1, 10, 19 and 28 were rejected under 35 U.S.C. 102(b) as being anticipated by Abdelmalek (US 5,937,652). Regarding claims 1, 10, 19 and 28, the Office Action alleges Abdelmalek to disclose a process and apparatus for the exothermic generation of syngas by the partial oxidation of a hydrocarbon-containing fuel that includes: 1) reacting the hydrocarbon-containing fuel (coal) with an oxygen containing gas in a first reactor to produce syngas as well as byproducts CO₂, H₂O, and soot, and 2) "introducing the syngas and byproducts (see char line and gas fuel line in Fig. 1) into a second reactor (boiler, (140)) containing a non-carbonaceous material (vessel) that holds the soot for a sufficient time such that the majority of the byproduct soot is gasified in the presence of byproduct CO₂ and/or H₂O to produce a stream that is depleted in the soot." It appears to Applicant, however, that the char fed to the boiler in the Abdelmalek process is completely combusted with externally supplied oxygen in order for the boiler to produce steam and is not used to produce syngas (see col. 6, lines 1-4). The pending claims all recite a limitation to the effect that the soot is gasified via reaction with the byproduct CO₂ and/or H₂O to produce a syngas stream that is depleted in the soot. As Abdelmalek does not describe such a process, it does not anticipate claims 1, 10, 19 and 28.

Claims 1, 9, 10, 18, 19, 27, 28 and 36 were rejected under 35 U.S.C. 102(b) as being anticipated by Lenglet et al. (US 2002/0106538). Regarding claims 1, 10, 19 and 28, the Office Action alleges that Lenglet discloses a process and apparatus for the exothermic generation of syngas by the partial oxidation of a hydrocarbon-containing fuel that includes: 1) reacting the hydrocarbon-containing fuel with an oxygen containing gas in a first reactor to produce the syngas and byproducts comprising CO₂, H₂O and soot, and 2) "introducing the syngas and byproducts into a second reactor (filter, 7, 14, see flow diagram of Fig. 1) containing a non-carbonaceous material (ceramic, paragraph [0027]) that traps the soot for a sufficient time such

that the majority of the byproduct soot is gasified (paragraph [0041]) via reaction with the byproduct CO₂ (from gasification of soot) to produce a syngas stream that is depleted in the soot (see abstract).” It appears to Applicant, however, that the soot in the Lenglet process, after being trapped in the filter, is combusted with externally supplied oxygen (see paragraph [24]) in order to regenerate the filter rather than reacting with byproduct CO₂ and/or H₂O to produce syngas as called for by the pending claims. The Lenglet reference thus does not anticipate claims 1, 9, 10, 18, 19, 27, 28 and 36.

In order to anticipate a claim under Section 102, a reference must disclose each and every feature recited by the claim. For at least the reasons stated above, the Abdelmalek and Lenglet references do not meet this test and therefore do not anticipate the pending claims. Furthermore, Applicant believes that no combination of elements in the Abdelmalek and Lenglet references would result in the claimed inventions and that there is no suggestion in the references that would motivate one of ordinary skill in the art to modify the described processes in a manner that would result in the claimed inventions. Withdrawal of the rejections is respectfully requested.

§103 Rejection of the Claims

Claims 1, 3, 6, 7, 10, 12, 15, 16, 19, 21, 24, 25, 28, 30, 33, and 34 were rejected under 35 U.S.C. 103(a) as being unpatentable over Edlund et al. (US 2001 /0045061) in view of Adiletta (US 200210141910). Regarding claims 1, 3, 7, 10, 12, 16, 19, 21, 25, 28, 30, and 34, the Office Action alleges that Edlund discloses a process and apparatus for the production of syngas from hydrocarbon containing fuel that includes reacting the hydrocarbon-containing fuel with an oxygen containing gas (partial oxidation) in a first reactor to produce the syngas as well as byproducts CO₂, H₂O, and soot and “introducing the syngas and byproducts (via conduit 36) into a second vessel (filter, 60) containing a non-carbonaceous material (sintered metal, ceramic, paragraph [0043]).” The Office Action concedes that Edlund fails to disclose a step where soot is gasified with the byproducts of the partial oxidation in the filter. Then Office Action then argues that Adiletta discloses an oxidation process with a filter (diesel exhaust filter) downstream from a combustion zone (engine) and teaches that the diesel particulate filter operates to trap the majority of the soot and then oxidizes them in the presence of a catalyst as a way of regenerating

the filter during operation. The Office Action asserts that it would have been obvious to incorporate the filter regeneration process described in Adiletta into the process of Edlund. The process described in Adiletta, however, appears to be a filter for removing particulate matter from engine exhaust in which the particulate matter is combusted in order to regenerate the filter. The Adiletta reference nowhere discusses the production of syngas from the reaction of the particulate matter with byproduct H_2O and CO_2 as recited in the rejected claims. (The generation of syngas that contains CO by an engine exhaust filter would obviously not be desirable.) Combining the teachings in the Edlund and Adiletta references thus does not result in the invention recited by claims 1, 3, 6, 7, 10, 12, 15, 16, 19, 21, 24, 25, 28, 30, 33, and 34, and Applicant finds no suggestion in the references for modifying those teachings to do so.

Claims 2, 11, 20 and 29 were rejected under 35 U.S.C. 103(a) as being unpatentable over Edlund et al. (US 2001 I0045061) and Adiletta (US 2002101 41 91 0) as applied to claims 1, 10, 19 and 28 above, and Clawson et al. (US 6,64 1,625). Regarding claims 2, 11, 20 and 29, the Office Action alleges that "Edlund, as discussed in claims 1, 10, 19 and 28 above, further discloses recovering a portion of the heat from the soot depleted syngas stream partial oxidation and using at least a portion of the recovered heat to facilitate the additional production of syngas via catalytic reforming of natural gas and steam (paragraph [0020]), which is known in the art as autothermal reforming (see Clawson col. 3 lines 53-62)." Applicant, however, believes that the recitations of claims 2, 11, 20 and 29 are patentably significant in the context of their combination with the subject matter recited by the independent claims.

Claims 8, 17, 26 and 35 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lenglet et al. (US 200210106538) as applied to claims 1, 10, 19 and 28 above. Regarding claims 8, 17, 26 and 35, the Office Action alleges that "Lenglet, as discussed in claims 1, 10, 19 and 28 above, discloses that the first reactor (3) is operated at a temperature of $1460^{\circ}C$ ($2600^{\circ}F$) and the second reactor (7) is operated at a temperature between $200^{\circ}C$ ($392^{\circ}F$) and $1050^{\circ}C$ ($2100^{\circ}F$) (see claim 1 (e))." The Office Action then argues that "(w)hile Lenglet doesn't explicitly disclose a temperature of the second reactor between $2100^{\circ}F$ and $2800^{\circ}F$, process variables (i.e. temperature) are considered results effective variables and are not considered to confer patentability to the claim." As explained above, however, Applicant believes that the process described in Lenglet is materially different from what is being claimed and that the limitations

recited by claims 8, 17, 26 and 35 are therefore patentably distinctive from the temperature ranges described in Lenglet.

Claims 4, 5 13, 14, 22, 23, 31 and 32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lenglet et al. (US 200210106538) as applied to claims 1, 10, 19 and 28 above, and further in view of Michalko (US 3,714,071). The Office Action alleges that Lenglet teaches a "non-carbonaceous material as ceramic combustion catalyst support for the combustion (high temperature) of hydrocarbons (paragraphs [0050] and [0054]) but does not explicitly disclose spherical alumina (a variety of ceramic) as the non-carbonaceous material. The Office Action then states that "Michalko teaches low-density alumina spheres/catalyst support (see abstract) that are utilized in an internal combustion engine to further oxidize/combust byproducts of the incomplete combustion of a fuel (col. 1 lines 3-30)" and argues that it would have been obvious to "utilize the low density alumina spheres of Michalko in the 2nd reactor of Lenglet as a preferable way of oxidizing the incomplete combustion byproducts (soot) with a catalyst and catalyst support of high strength at high temperatures." As explained above, Applicant believes that the process described in Lenglet is materially different from what is being claimed and that the limitations recited by claims 4, 5 13, 14, 22, 23, 31 and 32 are patentably significant in the context of their combination with the subject matter recited by the independent claims.

For the reasons stated above, Applicant submits that none of the pending claims are anticipated or rendered obvious by the cited references. Withdrawal of the rejections is respectfully requested.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (847) 432-7302 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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